

REMARKS

INTRODUCTION

In accordance with the following, reconsideration of the allowability of the claims is respectfully requested.

Claims 1-7 are pending and under consideration.

TAKING OF OFFICIAL NOTICE

The outstanding Office Action has indicated that the new references cited in the outstanding Office Action have been supplied to support the previous taking of Official Notice, but applicants respectfully note that the outstanding Office Action no longer relies upon the same to reject the pending claims. Accordingly, it is respectfully submitted that the previous taking of Official Notice has been withdrawn/overcome, in view of applicants' previous response.

REJECTIONS UNDER 35 USC 103

Claims 1-3 and 7 stand rejected under 35 USC § 103(a) as being obvious over Lee, EP 1,217,466, in view of Namiki et al., U.S. Patent No. 4,284,875. This rejection is respectfully traversed.

Again, by way of review and as an example, independent claim 1 sets forth:

"[a] fusing device for an electrophotographic image forming apparatus, the device comprising:

- a fusing roller with an outer rubber roller;
- a heating pipe disposed in the center of the fusing roller;
- a heating element disposed on the outer surface of the heating pipe; and
- a pressing roller which closely adheres paper passing between the pressing roller and the fusing roller to the fusing roller."

The outstanding Office Action has set forth similar rejection rationales as presented in the previous Office Action, i.e., that it would have been obvious to modify Lee to have an outer rubber roller. In the previous Office Action the underlying motivation was to prevent toner from adhering to the fusing roller. Similarly, the outstanding Office Action indicates that it would have been obvious to substitute a "silicone rubber layer for the outer protective layer in Lee because the heating roller will have excellent surface lubrication as taught in Namiki et al."

However, the underlying disclosure and invention of Lee is still of primary interest.

In addition, there must still be a reasonable rationale for modifying Lee from the preferred invention thereof.

Thus, it is respectfully submitted that there is no support in the record that Lee would need or desire the silicone rubber outer layer of Namiki et al.

In particular, Lee specifically details that the fusing roller should have a **metallic** outer layer that has excellent heat transferring properties, so that the heat from the heating pipe is instantaneously transferred to the fusing roller. See Lee on paragraph [0080], requesting a "metallic fusing roller having excellent conductivity, so that the surface of the fusing roller can be instantaneously heated up to a target fusing temperature to fix toner images that have been transferred to a print paper."

Lee similarly provides examples where the fusing roller is copper, in paragraph [0074], or aluminum with a higher hardness than aluminum spacers 213' between coils of heating unit 213, in paragraph [0060].

Thus, Lee particularly preferred the fusing roller to be metallic with instantaneous heat conductivity.

Conversely, Namiki et al. would not appear to be concerned with such instantaneous heat conductivity. In particular, col. 7, lines 5-26, provide examples of when reference outer surface temperatures were measured, i.e., after 5 minutes of 300 W being applied to the heater. Such a delay would not appear to take into consideration such an instantaneous heating.

The Office Action indicates that it would have been obvious to use the silicone rubber of Namiki et al. to have "excellent surface lubrication."

However, the Office Action does not address the fact that Lee already has excellent surface lubrication because of the used Teflon surface. In addition, the Office Action has failed to present any evidence that the silicone rubber would have better lubrication capability over a Teflon surface; while the opposite would appear to be so considering additional lubricants that may be necessary with the silicone rubber surface compared to a Teflon surface.

Thus, the recited motivation is not appropriate for Lee, as Lee does not need any alteration to provide "excellent surface lubrication". The Teflon protective surface would appear to perform this function already. The Office Action has also failed to provide any evidence contrary to this.

Again, as detailed in the present application, compared to Lee which uses a metallic fusing roller, embodiments of the present invention have removed the need or desire to have a metallic fusing roller by using heat resistant silicon rubber for the fusing roller. As detailed in the specification in paragraph [0027], the use of the rubber fusing roller permits the generation of a fusing nip having "a predetermined length, i.e., 6-7 mm, so as to aid fusing of the paper 150 which passes quickly in a high-speed laser printer."

Thus, contrary to the teaching of Lee, embodiments of the present invention use a rubber fusing roller. The high temperatures resident at the fusing roller have been further overcome by further embodiments requiring the rubber to be silicon rubber, which is resistant at high temperatures. In addition, paragraph [0043] of the present application, further provides an example where there is a heat gradient across the rubber fusing roller, such that the innermost surface of the rubber fusing roller may be 40-60 C higher than the outer surface of the rubber roller. These references to the specification are merely made for illustrative purposes to emphasize that the use of rubber is purposeful and inventive over the prior systems, e.g., Lee, and should not be interpreted to limit the invention to the same.

In addition, as previously noted, Lee explains in paragraphs [0003]-[0009] that conventional heating techniques either require extremely long heating times, require increases in the volume of the fusing roller apparatus, or complicate fabrication and manufacture.

Thus, though Namiki et al. illustrates the use of silicon rubber for an outer surface of the fusing roller, this system is for a conventional convection generating heating method.

The present application in paragraph [0043] provides an example of the problems associated with the use of silicon rubber in systems that have more instantaneous heating methods, like the presently claimed invention or those of Lee, i.e., that when a rubber outer surface is capable of being heated instantaneously additional consideration must be taken to prevent overheating the rubber roller. Thus, in such instantaneous systems as Lee the use of rubber outer surfaces may not be preferred because of the now available instantaneous heat transition.

There is no evidence in the record that Namiki et al. has addressed these issues, and rather, it would appear to perform the heating transition through a slower convection method to gradually heat the outer surface.

In addition, based on the date of Namiki et al., being filed before 1980, there is no evidence in the outstanding Office Action that Namiki et al. would not have preferred Teflon over the silicone rubber, considering that Lee is a more recent invention.

Accordingly, it is respectfully submitted that only the present application provides embodiments that permit the use of a rubber outer surface of the fusing roller in such instantaneous fusing roller systems.

Accordingly, in view of the above, it is respectfully submitted that it would not have been obvious to modify Lee as proffered in the outstanding Office Action.

Therefore, for at least the above, it is respectfully requested that this rejection of claim 1 be withdrawn and claim 1 be allowed. In addition, for at least similar rationale, it is respectfully submitted that claims depending from independent claim 1 are also in proper condition for allowance.

Claims 4-5 stand rejected under 35 USC 103 as being obvious over Lee, in view of Namiki et al., and further in view of Hirst et al., U.S. Patent No. 6,512,913. This rejection is respectfully traversed.

It is respectfully submitted that claims 4-5 are allowable for at least the above reasons.

In addition, it is noted that the Office Action sets forth the motivation of modifying Lee because of what Hirst et al. (arguably) discloses, i.e., the Office Action sets forth that the modification of Lee would have been obvious because "this diameter size is known in the state of the art for the purpose of fusing the toner image without making the image forming apparatus too large."

However, regardless of what sizes and diameters are used in the related art, the underlying motivation must be centered on Lee, i.e., there must be a reason or rationale to modify Lee, outside of what others have done.

At least in view of the above, withdrawal of this rejection is respectfully requested.

Claim 6 stands rejected under 35 USC 103 as being obvious over Lee, in view of Namiki et al., and further in view of Moriyama, JP 59-204071. This rejection is respectfully traversed.

It is respectfully submitted that claim 6 is allowable for at least the above reasons.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,
STAAS & HALSEY LLP

Date: August 1, 2005

By: 

Stephen T. Boughner
Registration No. 45,317

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501